B CLASS

1950.

File No. 1731/48 II

P.W. DEPARTMENT

E BRANCH

B CLASS

Subject:— Examinations

Professional, overseers

Printing of question papers

Set at —

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II

File No. 1731/48 E.

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Question Papers set at the Professional Examination of Overseers in the Year 1950

[*For official use only*]

BOMBAY
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1952

PROFESSIONAL EXAMINATION FOR PUBLIC WORKS DEPARTMENT OVERSEERS, 1950.

CENTRAL CIRCLE.

POONA CENTRE.

Building.

Oral (Optional)—50 Marks.

28th September 1950.

(TIME—9 A.M. TO 1 P.M.)

Marks.

1. What do you mean by bearing capacity of foundation ? What safe loads can be carried by— 6
   (*a*) Black soil, (*b*) Compact sand, (*c*) Murum, (*d*) Deccan trap.

2. What are the characteristic of good bricks of % water can each soak. What is the standard size of a brick ? How many bricks do you need for brick masonry 1st sort and 2nd sort ? 6

3. What is seasoned timber ? What is dry rot and wet rot ? What is the weight per cft. of—
   (1) Nimb, (2) Babul, (3) Chinch, (4) Teak Wood ? 6

4. (*a*) What is an English Board and what is a flemish Board ?
   (*b*) What is a thorough stone ?
   (*c*) Describe random rubble masonry.
   (*d*) What are lintels and why are they required ? What will be the length of a lintel for 3′ door and a 4′ window ? 8

5. How do you measure—
   (1) Distemper on inside only with door and window openings.
   (2) White washing inside and outside wall, door and window openings.
   (3) Painting of trellis work.
   (4) Warbed wire fencing with 5 rows of wire and teak posts at 8′ interval.
   (5) 1st Class door with panelled gazed and shutters 6

6. What is the usual relation of rise and trend of a staircase ? What is a half landing and a quarter landing ? What is a geometrical staircase ? 6

7. (*a*) What are the rates in your Division for the following :—
   (1) Slaked lime, (2) Cement, (3) Bricks, (4) Sand, (5) Metal · 1/2″ to 3″/4″ 5
   (*b*) What is a slump test ? What is slump ? How is it carried out ? 3

Marks.

8. What is the period after which forms can be struck in the case of the following :—

(1) Sides of a berm, (2) Bottom of heavy beam, (3) Bottom of floor step, (4) Sides of a wall, (5) Sides of a column 5

Roads.

Oral (Optional)—25 Marks.

28th September 1950.

(TIME—9 A.M. TO 1 P.M.)

1. How many bags of cement do you require per 100 c.ft. of concrete 1 : 2 : 4 and 1 : 4 : 8 and how much sand is needed for the same ? 8

2. What are the rates in your Division for—
   (1) Picking of metalled road surface.
   (2) Excavation for foundation in (*a*) soil and murum and (*b*) in soft rock.
   (3) A Blacksmith per day.
   (4) A Carpentar per day.
   (5) A Mason per day.
   (6) A Boy per day. 6

3. Define—
   (1) Catch water drain.
   (2) Dead men.
   (3) Water Table.
   (4) Berms.
   (5) Borrow pits.
   (6) Blindage.
   (7) Grouting.
   (8) Gauge mortar.
   (9) Plumb concrete.
   (10) Run off. 10

4. What is lead and what is lift ?
   How much can a bullock cart carry over a distance of 10 miles ?
   (1) $1\frac{1}{2}$" to 2" trap metal.
   (2) $1\frac{1}{2}$" to 2" laterite metal.
   (3) Steam coal.
   (4) Fuel wood.
   (5) Sand.
   (6) Slaked lime. 6

Marks.

5. What is the best material for blindage out of black soil, murum and sand, and why ? How are compositions formed and how you will remedy them. ? 5

6. Define the following—
   (1) Tee beam.
   (2) L Beam.
   (3) Box culvert.
   (4) Canti lever 4

7. What part do the steel and concrete play in an R.C.C. Beam ? Why are stirrups necessary for it and how do you space them ? 6

8. How do you measure 1½" metal, average murum, hard murum, sand and embankment ? 5

Arboriculture.

(Oral.)

28th September 1950.

(TIME—9 P.M. TO 1 P.M.)

1. Why is transplantation necessary in the case of seedlings in the Nursery ? 10

2. Name three trees which can be grown from their cuttings. What special precaution you will take to ensure satisfactory result regarding planting and growth. What is the best season for planting cuttings and why ? 10

3. Why is steadying of your trees necessary ? How do you ensure it ? 10

4. What are the usual sicknesses of plants and how are they remedied ? 10

5. Name 10 trees grown in your District 10

PROFESSIONAL EXAMINATION FOR SUB-DIVISIONAL OFFICERS, OVERSEERS, SUB-OVERSEERS OF THE DISTRICT LOCAL BOARDS IN CENTRAL DIVISION.

25th September 1950.

(TIME—11 A.M. TO 2 P.M.)

Roads Construction and Maintenance.

(Oral.)

(Any five to be asked.)

1. What is—

   (*a*) Template, (*b*) Barralling, (*c*) Traffic lane, (*d*) Ruling grade, (*e*) Surface painting, (*f*) dead men

Marks.

2. What is camber—
What camber you would adopt for (*a*) metalled district road, (*b*) macadam road in ghat portions where rainfall is heavy, (*c*) on tar carpet 5

3. Why catch wali drains are provided.
What is the use of road side gutters.
What is paved dip 5

4. What blindage is desirable for a murum road, for a grand road. What quantity for one spreading is required for 12′ width 5

5. What is the shrinkage allowance for—
Av. Murum.
3/4″ metal.
3″ Shingle.
Slaked lime. 5

6. What would be the rates of—
1 : 4 : 8 cement concrete.
R.C.C. slab for a drain.
Pier masonery 2nd sort.
Bullock rolling per mile 12′ wide metal. 5

7. What is a daily output for—
(*a*) a ten ton roller on 15′ wide metal road,
(*b*) a cody spreading blindage on 12′ wide, murum road from road side collection,
(*c*) a Mason dressing 6″ Khandkhies,
(*d*) Picking a hard metalled road 5

PROFESSIONAL EXAMINATION FOR 1950.

Village Water Supply.

(Oral.)

28th September 1950.

(TIME—9 A.M. TO 1 P.M.)

1. What are step wells? Why are they unhygenic? How would you convert them into draw wells?

2. Define—
(1) Water table, (2) Cone of infiltration, (3) Well kurb, (4) Yield of a well.

3. What are the rates provided in your Division for the following items of wells works :—
   (1) C. R. Masonry for stemming 40′ deep.
   (2) Masonry for parapet.
   (3) Khandki kerbing on 6″ of lime concrete.
   (4) A half round Hume pipe cattle trough 2′, in and 8′ long.

4. Villagers suggest a site for a well in nalla bed. Would you approve the site and why ?

PROFESSIONAL EXAMINATION FOR THE PUBLIC WORKS DEPARTMENT AND LOCAL BOARD OVERSEERS, 1950.

Practical Drawing.

26th September 1950.

(TIME—3 P.M. TO 6 P.M.)

Marks.

Note.—Attempt any one question and give complete details.

1. Design and draw plan, elevation and cross section of a gun powder magazine of size 10′×10′ and trial pit results as under :—
   0′ to 3′—black cotton soil.
   3′ to 5′—soft murum.
   5′ to 10′—hard murum.
   10′ to below—hard rock.

   Assume your own dimensions for doors, windows and other appertances.

   Scale—2′=1″ 100

2. Draw plan, cross section and longitudical section of a Hume pipe culvert on a Nalla with catchment area of 75 acres. The H.F.L. over Nalla bed being 5′ ; return walls to be provided ; other dimensions may be assumed.

   Scale—1′=1 100

3. Draw plan and cross section of a well and its appertanances, designed to supply water to a village of population of 600 ; trial pit results are as under :—
   0′ to 10′—soft murum.
   10′ to 15′—hard murum.
   15′ to 18′—geru.
   18′ to 20′—soft rock.
   20′ and below—hard rock.

   Scale—Any suitable 100

PROFESSIONAL EXAMINATION FOR P.W.D. AND D.L.B. OVERSEERS, 1950.

Test in Surveying and Setting out.

(Practical and Oral.)

27th September 1950.

(TIME—8 A.M. TO 1 P.M.)

Marks.

1. Two roads each 15′ wide cross each other at an angle of 45° line out the roads and set out a curve of 80 feet radius. 40
2. Take fly levels by back and fore method from a given B.M. and complete it on a given point; find out R.L. of that point by recording on a page of a field book .. 30
3. Given a Theodolite; find out a horizontal and vertical angles of given points 0

PROFESSIONAL EXAMINATION FOR THE P.W.D. AND LOCAL BOARD OVERSEERS.

Building Construction and Preparation of Materials.

29th September 1950.

(TIME—3 P.M. TO 6 P.M.)

Note.—Question Nos. 1 and 2 are compulsary

Solve any *five* questions from the remaining *nine* questions;

5 Marks are reserved for *neatness.*

1. A monolithic cement concrete Arch (1 : 2 : 4) of Vol. *2000* c.ft. is to be laid within *8 hours,* mixing to be done by machine operated concrete mixers :—
   (*a*) Calculate the quantity of cement, metal and other materials you will keep ready at site.
   (*b*) The number of requisite mixers and out-put of each per batch-mix.
   (*c*) How much water would you use per batch-mix of concrete
   (*d*) H.P. of the mixer ?— 20
2. Give characteristics of black cotton soil and the results of founding on it; what remedies would you adopt for constructing a building in such soil ? 15
3. Write down detailed specification for any *one* of the following :—
   (*a*) C.R. stone and cement masonry II sort.

Marks.

(*b*) Lime plaster 3/4" thick on new brick wall.
(*c*) Painting old wood work 12

4. What quantities are required for the following :—
(*a*) *Bricks* for 100 c.ft. of brick work in cement morter (1 : 6).
(*b*) *Mangalore tiles* for 100 s.ft.
(*c*) *Lime morter* for 100 c.ft. of III sort stone masonry.
(*d*) 8" *Khandkees* for parapet wall 50' long, 18" wide and 2' ht. in cement morter (1 : 6) 12

5. Give characteristic of good bricks and the tests you would apply for determining teir quality 12

6. Draw a sketch with detailed dimensions of King Post Truss roof with asbestos sheets span of truss 20' 12

7. Write out a set of instructions for your maistry who has to supervise the work of laying R.C.C. slab with beams *or* blasting operations in a quarry 12

8. Write short notes on :—
(*a*) Pat lime ; (*b*) Hydraulic lime ; (*c*) Water cement ratio
(*d*) Seasoning of timber ; (*e*) Curving of cement concrete. 12

9. Draw a sketch with dimensions of a bath room 10' × 10' in an Inspection Bungalow showing the following doors, wash basin, commode (Indian type), Dressing mirror, pegs etc. 12

10. Compare merits and demerits of any TWO of the following :—
(*a*) Lime mortar and cement mortar.
(*b*) G.I. sheets roofing and Asbestos sheets roofing.
(*c*) Course rubble and uncoursed rubble masonry. 12

11. Explain the following terms with sketches if necessary :—
(*a*) Drip Moulding ; (*b*) Quoins ; (*c*) Spandril ; (*d*) Relieving arch 12

(*Oral Test.*)

1. What are safe permissible loads on the :—
(*i*) Black cotton soil.
(*ii*) Hard Murum.
(*iii*) C.R. Stone masonry in lime.
(*iv*) Brick in cement mortar (1 : 6).

2. How much of the following make a cart load :—
(1) Mangalore tiles.
(2) Bricks.
(3) Sand.
(4) Asphalt drums.

3. What is slump Test ? When and where it is carried ? and how ?

4. What should be optimum size of the :—
   (1) Motor garage.
   (2) Road roller shed.
   (3) Indian Type Latrine.
   (4) Ex. Engineer's Office room.

5. What is the weight of :—
   (1) A cement bag.
   (2) Steel per cft.
   (3) G.I. Sheets.
   (4) Timber country.

PROFESSIONAL EXAMINATION OF OVERSEERS, 1950.

BOMBAY CIRCLE.

Sub-Divisional and Works Accounts.

(*Written.*)

(*Marks—100.*)

16th October 1950.

(TIME ALLOWED—11 A.M. TO 2 P.M.)

Marks.

1. Define :—
   (*i*) Advance Payment.
   (*ii*) Contribution Works.
   (*iii*) Administrative Approval.
   (*iv*) Issue Rate.
   (*v*) Sub-Work.
   (*vi*) Suspense Account — 12

2. How are payments made to :—
   (*a*) Departmental Labour.
   (*b*) Labour engaged through a Contractor :—
      (*i*) Local Labour,
      (*ii*) Imported Labour — 10

3. Prepare a imaginary Muster Roll for 8 days for carrying out the following works adopting the rate prevailing in your division and complete it in all respects till it is submitted as a voucher to the Divisional Office. Assume some labourers remain unpaid. You are an imprest holder :—
   (*i*) White washing 3 coats — 1,500 s.ft.
   (*ii*) Sharpening pickaxes — 10 Nos.
   (*iii*) Picking up road surface — 1 Furlong (15′ wide).

Marks.

(*iv*) Spreading metal 1300 Cft.
(*v*) Spreading Murum 600 Cft.
(*vi*) Consolidation with bullock roller including artificial Watering 1 Furlong (15′ Wide). 20

4. Enumerate the several authorised forms of bills and vouchers in use and describe briefly when each one of this is used ? 10

5. What is meant by Imprest Account ? And what is the ordinary maximum limit of it ? When should this account be submitted ? What is the main difference between Imprest Account and Cash Book ? When temporary advances are given ?

Work out an imprest account with the following date :—

	Rs.	a.
(*i*) Imprest sanctioned under Executive Engineer's No. 1265, dated 20th April 1950.		
(*ii*) Cash balance brought forward for last account dated 1st September 1950	15	6
(*iii*) Payment of Hand Receipt for railway fares to Khalashi. 2nd September 1950.	0	14
(*iv*) Recoupment of imprest for the Sub-Divisional Officer, on 4th September 1950	450	0
(*v*) Payment of supplier's bill on 5th September 1950	9	8
(*vi*) Payment of acquittance roll of Roller driver on 5th September 1950	100	0
(*vii*) Hand receipt for conveyance of coal, on 6th September 1950	16	8
(*viii*) Payment of Muster Roll on 6th September 1950. (Unpaid wages Rs. 24-8-0)	205	14
(*ix*) Receipt for sale of grass on 8th September 1950	25	0
(*x*) Railway freight for conveying of Apshalt on 10th September 1950	39	4

Adopt suitable names of works and payees and give proper allocation.

Omit any entries which cannot be accounted for in the Imprest Accounts giving reasons for the same.

You are transferred from the section and are required to hand over charge of the section on 12th September 1950 20

Marks.

6. As an Overseer in charge of a section, give a list of account documents you are expected to submit to your Sub-Divisional Office with due dates of submission and also state what account documents you are expected to receive from subordinates under you and on what dates. 8

7. You have got a Travellers' Bungalow in your charge. It is fully furnished and is provided with a sweeper. It has got electric lights but no fans and has water supply. State what rents you will ask the Chowkidar to recover in the following cases :—
   (*i*) A Class I officer occupies the bungalow for 3 days.
   (*ii*) A Class II Officer occupies the baungalow from 8-30 a.m. to 5-30 p.m.
   (*iii*) A Superintendent of Post Offices occupies the bungalow for 5 days.
   (*iv*) A Gazetted Officer occupies the bungalow on his transfer journey for 3 days.
   (*v*) An Officer of a Local Body continues to occupy the bungalow for 3 or 4 months without any authority.. 10

8. State the circumstances and conditions under which you issue Government (1) Tools and (2) Materials from stock to the following persons and what account is maintained by you and how the transactions are shown ? :—
   (*i*) A pieceworker.
   (*ii*) A contractor.
   (*iii*) A Local Body.
   (*iv*) A Zamindar or Landlord 10

PROFESSIONAL EXAMINATION OF PUBLIC WORKS DEPARTMENT OVERSEERS.

BOMBAY CIRCLE.

Building Construction and Preparation of Materials.

(*Marks—100.*)

16th October 1950.

(TIME—3 P.M. TO 6 P.M.)

1. (*a*) What is Portland Cement ? What are its ingredients ? What do you understand by the term "Setting" ?
   (*b*) What do you understand by the terms "Normal Setting Cement", "Quick Setting Cement" and "Rapid Hardening Cement" ? Also state the situations where their use is recommended 13

2. (*a*) State briefly the characteristics of good bricks. What is the standard size of bricks used in your division ? How many bricks are required for 100 Cft. of brick masonry II Class.
   (*b*) Draw a dimensioned sketch giving the certical cross section of (*i*) a plain planked window 3'-0"×4'-0" and also (00) a plain planked and iron barred window 3'-0"×4'-0" 13

Marks.

3. (*a*) Explain the following with the help of Sketch :—
   (*i*) Gulley trap.
   (*ii*) Man hole.
   (*iii*) Sewer.
   (*b*) What are the common shapes and materials used for Sewers ? 13
4. Define the following terms with sketches :—
   (*a*) Nosing.
   (*b*) Damp Proof Course.
   (*c*) Relieving Arch.
   (*d*) Header.
   (*e*) Breast Wall.
   (*f*) Lean to roof.
5. Give specifications for :—
   (*i*) Uncoursed rubble masonry in cement mortar with cement pointing.
   (*ii*) Galvanised Corrugated Iron Roof Covering 13
6. (*a*) Name the common types of roof trusses used in domestic buildings and state for what spans they are used ?
   (*b*) Draw a sketch showing the king post roof truss with Mangalore tiles roofiing for a building with a clear span of 16'-0". The truss is supported on 18" walls. Also give sizes of sections used.
7. (*a*) What is R.C.C. ? What are its advantages ? What is the function of steel ? What are the usual proportions adopted on building work ?
   (*b*) Define "Water-Cement ratio". How much water do you use normally for mixing concrete 1 : 2 : 4 per bag of cement ? 13
8. Find the Maximum bending moment on a simply supported floor beam of 10'-0 effective span which carried a.u.d. load of 400 lbs. per Rft. and a concented load of 500 lbs. at the centre. Sketch the B.M. Diagram 9

PROFESSIONAL EXAMINATION OF OVERSEERS, 1950.

BOMBAY CIRCLE.

Optional Written Paper.

(*Marks—50.*)

17th October 1950.

(TIME—11 A.M. TO 2 P.M.)

Section I

Note.—Please give separate paper for each Section. Passing separately in each Section is necessary.

Roads.

1. You are asked to start the construction of a new road where there is embankment and also cutting. Describe how you would proceed and what precautions and particular

Marks.

care you would take to see that there would be no trouble of any sort with the contractor, till the final measurements are taken ? What instructions you will give to your subordinates and what checks you make, and when ? During the progress of the work 15

2. You are asked to plant as many seedlings as possible to serve as roadside trees in your section during a particular week in the month of July. What steps you will take to plant these and how would you protect it and what will be the approximate cost of planting a tree and maintaining it for 3 years ? Give the cost for each year with details 12

3. Describe the method and process of filling potholes and ruts on roads in monsoon and in fair seasons on—

(*i*) Water Bound Macadam Road,

(*ii*) Asphalt roads 8

4. Describe with rough sketch :—

(*i*) Return walls.

(*ii*) Wing walls, and

State where each is used and why ? Discuss the relative advantages and disadvantages of the same 5

5. Give specifications for 2″ Semi Grout premix asphalt macadam surface with a seal coat on an existing water bound macadam surface which has got many pot holes and give the quantity of materials required for a length of 1 furlong 10′ wide 10

Section II.

Buildings.

(*Marks—50.*)

1. What are the characteristics of black cotton soil in foundation and what will be the result if buildings are constructed on such foundations and why ? What are the remedies to improve such foundations to make the structures founded on these safe and sound ? 10

2. Give detailed specifications for coursed rubble masonry II sort 10

Marks.

3. The following items of work are to be carried out in a building. Calculate the quantity of cement required for each of the item mentioned below and give details of calculations :—

(*i*) Cement concrete for foundation 1 : 5 : 10. — 1300 Cft.

(*ii*) Uncoursed rubble masonry 18″ thick in cement mortar 1 : 6 for foundation. — 800 Cft.

(*iii*) Superstructure of B. B. masonry II sort 14″ thick in cement mortar 1 : 6, including cement pointing. — 1,600 Cft.

(*iv*) Cement concrete floor 1½″ thick patent stone over 4½″ thick cement concrete 1 : 4 : 8. — 1,200 Sft.

(*v*) Rough cast cement plaster .. — 600 Sft.

(*vi*) Superstructure of coursed rubble masonry II sort 18″ thick, in cement mortar 1 : 6 including cement pointing outside and plaster inside. — 300 Cft.

.. .. 10

4. You are posted to look after and supervise the work of a new residential quarters for a Mamlatdar about to start. The work consists of (*i*) Filling in concrete with lime concrete, (*ii*) Part Shahabad paving and part patent stone flooring, (*iii*) Plinth of C.R. masonry III sort, (*iv*) Superstructures of B.B. Masonry in cement mortar, (*v*) Plaster inside and pointing outisde, (*vi*) Part Mangalore tiled roofing and part Asbestos Sheet roofing.

State what action you would take from time to time to ensure completion of the work within the time limit as per specifications, till the building is handed over finally to the Department, specially when the contractor is an inexperienced and quarrlesome ? What particular care you would take during the progress of work and during your inspection. 15

5. Show with hand sketches :—

(*i*) A scarf joint in the post plate over a post.

(*ii*) post, post plate and common rafters in a building.

(*iii*) Correct method of building steps in front of door sills. 5

PROFESSIONAL EXAMINATION OF OVERSEERS, 1950.

BOMBAY CIRCLE.

Practical Drawing.

(*Total Marks—100.*)

17th October 1950.

(TIME—3 P.M. TO 6 P.M.)

1. Draw to a suitable scale, half sectional elevation half plan and a cross-section of a high level masonry arched bridge from the following data :—

(*I*) *River Bed*—

(*i*) R. L. of ground at centre of bed = 80·4 and rises gradually to 90·0 at the faces of abutments.

(*ii*) Foundation consists of hard rock at a depth of 2′-0″ below ground level.

Sub-Structure Details—

(*iii*) No. of piers = 6, No. of abutments = 2 } of C.R. masonry.

(*iv*) No. of spans=7 of 60′ clear.

(*v*) Top width of pier = 7′-6″

(*vi*) Side better of pier = 1 in 18.

(*vii*) Top width of abutment = 10′-0″ with face vertical and a back batter of 1 in 4.

(*viii*) R. L. of top of piers = 102·30.

(*ix*) R. L. of springing = 105·30.

(*x*) Pier caps to be of C.C. 1 : 2 : 4.

(*xi*) Cut and ease waters are semi-circular.

(*xii*) Length of pier at top = 34′-6″.

Wing Walls—

(*xiii*) Top width 1′-6″

(*xiv*) Splay of 30′

(*xv*) Batters Front 1 in 8.
Back 1 in 4.

(*xvi*) Wing wall starts from road level.

Superstructure Details—

(*xvii*) Thickness of arch ring = 13 inches.

(*xviii*) Radius of arch ring = 43′-6″.

(*xix*) Rise of arch = 12′-0″

(*xx*) Length of arch barrel = 27′-6″

(*xxi*) Murum filling over crown of arch = 12 inches.

(*xxii*) Haunch filling of concrete upto R.L. 110·25.

(*xxiii*) Thickness of road slab over murum filling = 6″

(*xxiv*) Width of carriage way between kerbs = 22′.

(*xxv*) Kerbs to be of 9″ × 12″ (width) R.C.C.

(*xxvi*) Finished road level = 123·38.
(*xxvii*) Thickness of parapet = 1′-6
(*xxviii*) Height of parapet = 3′-6″ with 6 inches thick C. C. coping.
(*xxix*) Side slopes of approach embankment are $1\frac{1}{2}$: 1.

Note.—Any other details required and not given may be assumed.

Surveying and Setting.

18th October 1950.
(TIME ALLOWED—3 HOURS.)

Section I

Surveying.

Marks.

1. (*a*) Level along the given stations and make up a copy of the field book and complete the latter in all respects. **15**
   (*b*) Measure the angle between the two given points with the help of the given theodolite. **15**

Surveying and Setting Out.

(*Oral Questions.*)
18th October 1950.
(TIME ALLOWED—3 HOURS.)
Section I.
Surveying.
(*Total Marks—20.*)

1. Distinguish between the permanent and temporary adjustments of a level.
2. What is the bubble made of ?
3. What is local attraction in prismatic compass ? How do you find out the same ?
4. What are tie lines ?
5. What is recommansance survey ? What is the purpose ?
6. A question on contouring.
7. What is a box-sextant ? Where is it normally used ?
8. What is Simson's rule ?

Surveying and Setting Out.

(Oral Question—Marks 15.)

18th October 1950.
(TIME ALLOWED—3 HOURS.)

Section II.

Setting Out.

1. What are the different types of curves normally used on roads ?
2. List out the equipment normally required for the purposes of setting out.

Surveying and Setting Out.

18th October 1950.
(TIME ALLOWED—3 HOURS.)

Section II.
(Marks—35.)

1. Set out a curve of 200 ft. radius by the chord and offset method.

Roads.

(Oral.)

Marks.

1. What is camber in a road ?
   What is the camber for—
   (*i*) Water Bound Macadam road,
   (*ii*) Asphalt road,
   (*iii*) Concrete road,
   and how do you make yourself sure that proper camber is given.
   What is the maximum safe camber ? 10

2. Why and where are these constructed ? :—
   (*i*) Catchwater drain.
   (*ii*) Water cushion.
   (*iii*) Nalla diversion.
   (*iv*) Dips.
   (*v*) Catchpit 10

Marks.

3. For the work of maintenance of roads what sort of labour would you prefer and why ? i.e., Labour on daily muster Roll or Gang system of labour ? 5

Buildings.

(*Oral.*)

1. You are in charge of some tenements and find the following defects. State the causes of troubles of these and also what order would you give to put things right.
   (*i*) White washing being rubbed easily by hand.
   (*ii*) Painting of wood work sticky.
   (*iii*) Cracks in the walls and floors.
   (*iv*) Skin of the round bullies not removed. ... 10
2. How do you take the measurements of :—
   (*i*) Glazer's work.
   (*ii*) Painting work of ceiling, doors, windows, etc.
   (*iii*) Wood work, such as purlins, post plates, posts etc.
   (*iv*) Painting of trallies work.
   (*v*) Manglore tiled roofing. 15

Building Construction and Preparation of Materials.

(*Oral.*)

1. What do you understand by the terms,—
   (*i*) Safe permissible load.
   (*ii*) Factor of Safety.

   What are the safe permissible loads and factors of safety in the following masonry works :—
   (*i*) Brick in mud.
   (*ii*) Good hand burnt brick in lime mortar.
   (*iii*) Ashlar masonry (prebinder). 6
2. (*a*) What is the quantity of the following materials conveyed in a motor truck of 3 tons capacity :—
   (1) Metal, (2) Sand, (3) Manglore tiles.

   (*b*) Differentiate the following :—
   (1) Hard rock, (2) Soft rock, (3) Hard murum, (4) Soft murum, (5) Average murum 9
3. What is Raft foundation and where this type of foundation is used ? 5
4. What is lime cement mortar and surkhi mortar and where each is used with advantage. Discuss the merits and demerits of the same compared to plain cement mortar and lime mortar ? 6

Marks.

5. What is seasoning in wood ?

What is carpenter's work and joiner's work, and how each is measured ? 5

6. How would you solve the following problems ? :—

(*i*) A foundation which meets with water beyond the capacity of your pump.
(*ii*) Transport of heavy material on a muddy road.
(*iii*) Checking the verticality of long building columns.
(*iv*) Checking the back batter of a retaining wall.
(*v*) Prevent the leakage of fine cement paste from form work in R.C.C. construction 9

7. Why paint is used in a building and give the materials required for 1st, 2nd and 3rd coat for 100 Sft. of painting.

What colour or shade you would prefer to give in drawing room, bed room, kitchen, and bath in bungalow and why ? 5

8. What is a lightening conductor ? Where and why it is used ? When do you inspect it ? And what points you would particularly attend while inspecting it ... 5

DECCAN IRRIGATION CIRCLE.

Sub-Divisional and Works Accounts.

(*Written—Marks—100.*)

30th October 1950.

(TIME—11 A.M. TO 2 P.M.)

1. Describe briefly the use of—

(*a*) Transfer entry order.
(*b*) Triplicate Receipt Book.
(*c*) Imprest Account.
(*d*) Hand Receipt.
(*e*) Requisition.
(*f*) Rate List.
(*g*) Road Metal Rate Book.
(*h*) Schedule of Rates 16

2. (*a*) What is a Nominal Muster Roll ? Describe the parts into which a Nominal Muster Roll is divided and describe the usefulness of each part. What documents are required to be verified and prepared before a M.R. can be passed for payment ? 14

Marks.

3. What is a Measurement Book? What are the rules for recording measurements. What are the Overseers powers with respect to recording measurements. Can measurements be written in pencil and inked over afterwards? 13

4. Prepare an imprest account of the following items for submission to the S.D.O. :–

	Rs.	a.	p.
(1) Balance on 1st July 1950	21	15	0
(2) Recoupments from S.D.O. on 3rd July 1950	28	1	0
(3) Paid Railway freight on 4th July 1950..	1	5	0
(4) Paid carriage of unserviceable tools on 3rd July 1950	10	0	0
(5) Paid rent of store on 5th July 1950 ..	3	0	0
(6) Recovered from a factory for issuing water for non-agriculture purposes on 4th July 1950	240	0	0
(7) Received rent for Bungalow on 8th July 1950	3	0	0
(8) Received temporary advance for payments of muster roll on 9th July 1950 ..	100	0	0
(9) Paid M. R. on 11th July 1950 ..	93	5	0

What is the usual limit of imprest advance given to a Sectional Officer?

How often is the imprest account required to be submitted and to whom?

(*b*) If you are in charge of a beat which is away from the S.D.O.'s Headquarters and you are an imprest holder how would you deal with money you receive on account of rents of (*a*) Government Buildings, (*b*) Auction Sale, (*c*) Money received from Karkuns on account of rents of quarters and how will you acknowledge the receipt of the money 20

5. You have to hold an auction sale for grass in Government land. Describe the procedure of the auction sale till papers are submitted to S.D.O.

Enumerate the conditions of sale usually prescribed .. 13

6. Explain the difference between :—
   (*a*) Original Work and Repair Work.
   (*b*) Revised Estimate and Reduced Estimate.

Marks.

(*c*) Piece work and Contract.
(*d*) Major Work and Minior Work.
(*e*) Material at site account and on stock.
(*f*) Requisition and Indent. 13

7. What steps you would take if the M.R. is lost :—
(*a*) Before recording of measurements.
(*b*) After recording of measurements. How will the labourers of that M.R. be paid ? 11

Building Construction and Preparation of Materials.

(*Written—Marks—100.*)

30th October 1950.

(TIME—3 P.M. TO 6 P.M.)

1. (*a*) Give the characteristics of the following materials and state where each is used in Engineering Construction :—
(1) Fat Lime.
(2) Hydraulic Lime.
(3) Slaked Lime.
(4) Quick Lime.
(*b*) How would you prepare Hydraulic Lime from Fat Lime.
(*c*) How would you test if a given specimen of lime is Hydraulic or otherwise. 14

2. Write notes on :—
(*a*) Water Cement Ratio.
(*b*) Grading of aggregate.
(*c*) Curing of Concrete.
(*d*) Tamping and Ramming. 12

3. What are the characteristics of good timber ? Why is seasoning necessary ? What is wet and dry rot and when do they occur ? What precautions are usually taken to preserve timber ? 12

4. Draw a sketch of a 30′ span truss for Manglore Tiled Roofing. Show details of joints. 15

5. Write short notes on :—
(*a*) English Bond and Flemish Bond.
(*b*) Purlin Rafter Construction.
(*c*) Relieving Arch.
(*d*) Dado.
(*e*) Gauged Mortar.
(*f*) Underpining. 12

Marks.

6. What type of flooring-would you use for—
   (*a*) I Class Inspection Bungalow.
   (*b*) A Store Room.
   (*c*) Chowkidar's Quarters.
   (*d*) Operation Room in a Hospital
   Workout cost of 100 s. ft. for any two types of flooring. 12

7. What is the usual guage of C. G. I. Sheets used in roofing ? In what sizes are they generally supplied ? What overlap should they be given while being laid ? How are they fixed ? 11

8. Draw neat hand sketches of—
   (1) Joint of a post, post plate and common rafter in a Verandah Roof.
   (2) Section of a Wooden staircase showing tread, riser and newel.
   (3) Cut stone drip moulding and corbels of verandah roof.
   (4) Rebated and Filleted and Rebated Tongued and Groved Joint 12

Drainage.

(*Optional Written—50 Marks.*)

31st October 1950.

(TIME—11 A.M. TO 2 P.M.)

1. Describe the different soils you know and meet in irrigation drainage project and their classification in detail with situation 10

2. What are the main papers of Drawings etc., to be submitted along with a complete drainage project and give in short its object 10

3. How will you maintain a drainage scheme of which you are in charge effectively, what important points are to be looked to ? 10

4. Write short notes on :—
   (1) Recuperation, (2) Ramp, (3) Observation Tubes, (4) Capillary Attraction, (5) Turfing 10

5. Write out a specification in detail to be attached to an agreement for laying a 6" C.C. pipe line to a drainage scheme 10

Irrigation.

(Optional Written—50 Marks.)

31st October 1950.

(TIME—11 A.M. TO 2 P.M.)

Write any five questions.

Marks.

1. Certain villagers have applied to you for a minor irrigation works to be constructed over a small nalla nearby for growing food and fodder. What preliminary investigations would you carry out to find if the scheme is feasible ? If found feasible what pucca surveys will have to be carried out ? 10

2. If an irrigator gives a water application in the Sectional Office for Rabi Crop—describe how you will verify it and complete it ? Explain its disposal till recovery of Water Cess 10

3. How many varieties of Blocks are there ? What is the object of them ? What are the main rules for sanction of those ? 10

4. What is a panchanama in irrigation ? Describe different varieties of the same. In inspection if you find unauthorised cane crop in Hot Weather Season how will you charge it ? Give complete process of holding the panchanama 10

5. What duties do you obtain at the head of the Canals Godavari, Pravara and the Nira ? And what per cent. loss observed in transit ? 10

6. What is meant by supply of water to crops by " Volume " ? Where is this being adopted at present ? How is volume of water to be delivered fixed ? And how is quantity measured ? What are the advantages of such a supply over the usual supply of water to crops on area basis ?
Write down a simple assessment paper for a Sugar Factory for—
(*i*) Cane crop.
(*ii*) Food crop. 10

Buildings.

(Optional Written—50 Marks.)

31st October 1950.

(TIME—11 A.M. TO 2 P.M.)

1. What are the different types of roofing materials usually met with ? What are the characteristics of each ? Where would you recommend the use of each ? Work out the cost per 100 sft. of any two ... 12

Marks.

2. Write out specifications and work out rate abstracts for any 2 :—
   (*a*) C.R. masonry II sort in cement mortar 1 : 6.
   (*b*) 3/4″ lime plaster.
   (*c*) Burnt brick in lime IInd class with lime pointing. 12

3. What are the properties of black soil ? How would you design foundations for a buiding on Black soil ? .. 13

4. Show with sketches the position of reinforcement in R.C.C. work :—
   (1) Lintel over door opening.
   (2) Slab over opening of two spans.
   (3) Cantilever.
   (4) Column.

   When can the form-work be removed in each case ?

   (*ii*) What is cover over reinforcements ? Why is it necessary ? 13

Roads.

(Optional Written—50 Marks.)

31st October 1950.

(TIME—1½ HOURS.)

1. An existing waterbound macadam surface of a Provincial Road has gone bad, and has to be resurfaced with a 2″ metal coat over a length of one mile—
   (*i*) Give quantities and costs of the different materials required.
   (*ii*) Describe the whole operation making special note of precautions during rolling.
   (*iii*) What will be the cost per mile ? Assume artificial watering 14

2. You are to prepare a project for a road. Describe what data you would collect ? What field work you would carry out and what drawing and papers you would prepare for submission 13

3. Write short notes on—
   (1) Super Elevation.
   (2) Corrugations on road surfaces.
   (3) Catch Water Cutters.
   (4) Crete Ways.
   (5) Confalt Surface 10

Marks.

5. What are the current rates in your Division for the following :—
   (*i*) Excavation in murum and boulders.
   (*ii*) B.B. masonry in lime.
   (*iii*) 3/4th masonry lime plaster.
   (*iv*) C.R. masonry II sort in cement mortar 1 : 6.
   (*v*) Cut stone work for steps 10

Buildings.

(*Optional Oral—Marks—25.*)
31st October 1950.
(TIME—3 P.M. TO 6 P.M.)

1. What are quantities required for :—
   (1) Cement bags per brass of 1 : 2 : 4 concrete.
   (2) Cement bags for C.R. Masonry II sort 1 : 6 mortar.
   (3) Metal required for 100 Cft. of concrete.
   (4) Sand required for 100 Cft. of concrete.
   (5) No. of tiles (Mangalore) per 100 Sft. of roof .. 5

2. What are the precautions to be taken in storing cement ? .. 5

3. If you are to select site for a school building what points would you bear in mind ? How would you site the building ? 5

4. (1) Why are bricks soaked in water before use ?
   (2) Why is masonry watered ?
   (3) What is the difference in the operation of laying lime concrete and cement concrete ?
   (4) What are the usual dimensions of a lime Ghani worked by bullocks ?
   (5) Lime plaster shows blisters sometimes. How would you avoid getting the trouble ? 10

Roads.

(*Optional Oral—Marks—25.*)
31st October 1950.
(TIME—3 P.M. TO 6 P.M.)

1. How are the following measured and paid for :—
   (*i*) Embankment for Road.
   (*ii*) Metal.
   (*iii*) Rubble.

Marks.

(*iv*) Hard Murum.
(*v*) Sand.
(*vi*) Lime and cement 6

2. What are the different kinds of trees planted along road side. While Maintaining those trees what points are to be specially attended to ? 4

3. What are the current rates in your Division for the following items of work ? :—

(1) Picking up road surface.
(2) Guard stone 8″×8″×2′-6″ per No.
(3) Spreading metal.
(4) Bullock Rolling one mile } Including artificial water 6
Or
Steam Roller Rolling. }

4. What is meant by :—

(*i*) National Highway.
(*ii*) M. D. R.
(*iii*) O. D. R.
(*iv*) Village road.
and what is the formation width
land width
and metal width in case of each ? .. 9

Irrigation.

(*Oral—Marks—25.*)
31st October 1950.
(TIME—3 P.M. TO 6 P.M.)

1. What are the different types of measuring devices in use on the Major Canals in the Decan ? Briefly explain their working 4

2. What is meant by:—

(*i*) Day cusec. (*ii*) Rotation. (*iii*) Post Seasonal watering. (*iv*) Afflux. (*v*) Balancing tank. (*vi*) AI/DC. .. 3

3. Why does silt accumulate in :—

(*i*) Canal.
(*ii*) Nalla bed and how is this prevented ? 4

4. What is "Phad System" of irrigation and where is it practised ? 4

Marks.

4. What are the different types of Road surfaces and under what conditions is each suitable ?

Or

Enumerate premonsoon and postmonsoon repairs to Roads with respect to—

(*i*) Ghat Roads,
(*ii*) Road passing through low lying areas.
(*iii*) Culverts and dips 13

Building Compulsory.

(*Oral—50 Marks.*)

31st October 1950.

(TIME—3 P.M. TO 6 P.M.)

1. What are the average weight of—

(*i*) Portland cement per Cft.
(*ii*) Cement concrete per Cft.
(*iii*) Stone masonry per Cft.
(*iv*) Teak wood per Cft.
(*v*) Cast iron per Cft. 0

2. How are the following measured and paid for ?

(*i*) White washing.
(*ii*) Khandkies.
(*iii*) Painting glazed door.
(*iv*) Venetians.
(*v*) Headers 10

3. How much of the following will make a 3 tons truck load ?

(*i*) Metal $1\frac{1}{2}''$ gauge.
(*ii*) Rubble.
(*iii*) Mangalore tiles.
(*iv*) Cement bags.
(*v*) Steam coal 10

4. What work would you expect per day from an artisan and labour in the case of ?

(*i*) C.R. masonry II sort in lime.
(*ii*) B.B. masonry II sort in lime.
(*iii*) Pointing stone work.
(*iv*) White washing 3 coats.
(*v*) Country double tiling 10

Marks.

5. State ( ) days cusecs = 1 M. cft.
= Acre feet. 3

6. State the formula for working out cubical contents of a tank. 3

7. What is the yield per acre of land irrigated by canal water of :—
(*i*) Cane.
(*ii*) Jowar.
(*iii*) Wheat. 4

Drainage.

(*Optional Oral—Marks—25.*)

31st October 1950.

(TIME—3 P.M. TO 6 P.M.)

1. What rates are adopted in your Division for estimating the cost of drains in—

(1) Excavation in chopan soil in percolating water.
(2) Excavation in soft murum in percolating water.
(3) Excavation in hard murum in percolating water.
(4) Dressing spoil banks for service road 6

2. Explain why lands under canal are usually spoiled with reasons. How does water logging occur and to what extent drainage helps to remedy this evil ? .. 5

3. What are the advantages of a pipe line and an open trench ? When will you prefer a pipe line to an open trench ? .. 5

4. Why are man-holes provided in a pipe line ?
What is an observation tube ? Where is it fixed and how is it used ? 3

5. How are discharges in an open trench and in a pipe line measured ? 3

NASIK.

Surveying.

1st November 1950.

(TIME—1½ HOURS.)

1. Find the difference of level between the two points shown to you. Record your Readings in field Book form with necessary check etc. 20

Marks.

2. Find the given area with a Planimeter Scale—1 660—Find area in acres 10
3. With the compass find the angle between two lines (These lines were in the 1st and 4th quadrant) .. 5
4. What are the permanent adjustments of level ?. .. 3
5. You have a level which is out of adjustment. How would you use it for accurate work ? Say there is no time for attending to—adjustment and the levelling work is not very extensive .. 4
6. Read the angle on the Theodolite. .. 5
7. How would you set out a curve with cham and tape only .. 3

Practical Drawing..

(Marks—100.)

1st November 1950.

(TIME—2-30 P.M. TO 5-30 P.M.)

1. Draw plan, Elevation and Cross Section for a P. W. D. Rest House :—

   (1) Verandah in front and rear.
   (2) One Hall.
   (3) Two bed rooms with baths attached.

   Assume your own data.

   The ground is sloping East West on a slope of 1 in 25. Hard murum is available 4 feet below ground level .. 100

PROFESSIONAL EXAMINATION OF P. W. D. OVERSEERS, 1950.

SOUTH GUJARAT CIRCLE.

CENTRE SURAT.

Sub-Divisional and Works Accounts.

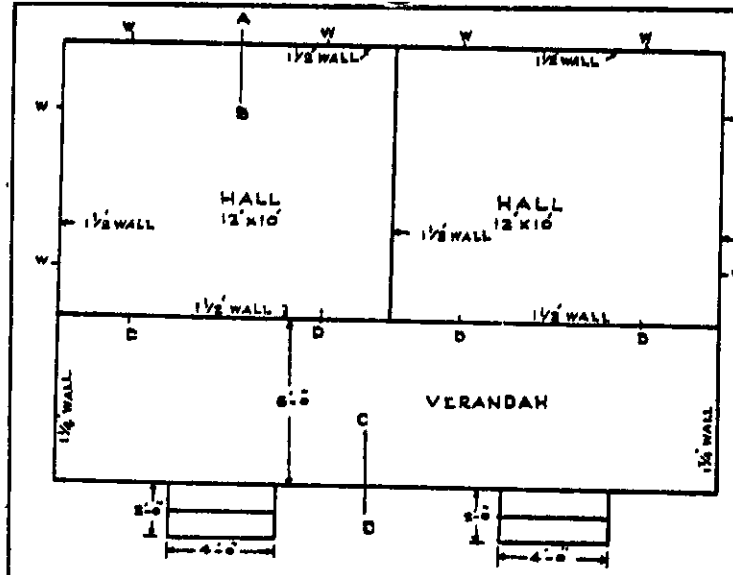
(Written—Marks—100.)

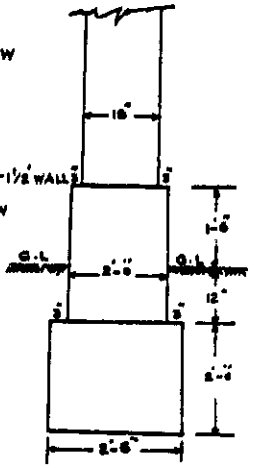
7th August 1950.

(TIME—11 A.M. to 2 P.M.)

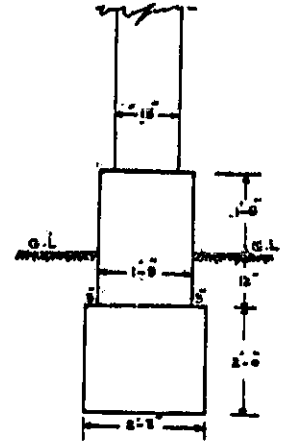
Note.—Attempt any six questions. Question No. 1 is compulsory.

1. Prepare parts I, II and III of an imaginary Muster Roll of Rs. 300 (approximately) for the period 21-6-50 to 20-7-50.





SECTION ON A. B



SECTION ON C.D

TRACED BY.
P.G. KEWALRAMANEY.

CHECKED BY:—
S.G. GOGVEKAR. 30-4-51
HEAD DRAFTSMAN. P.W.D.
SECRETARIAT. BOMBAY.

PROFESSIONAL EXAMINATION
FOR
OVERSEERS (1950)

LINE PLAN OF BUILDING GIVEN FOR SETTING OUT FOR PRACTICAL.

G.P.Z.: P. POONA, 51.

Marks.

Data :—The work was done as follows :—

(1) Items of (*a*) masonry & coping on a dram of 5¹ span ; (*b*) Widening sidewidths & consolidation by roller were done, on the Major Work of bringing one mile of existing road to N. H. Standards including improving weak Minor Bridges.

(2) Items of Repairs to Doors and Windows and stopping leakages in Mamlatdar, Kacheri : District Bungalow & Sub-Judges Court at your Headquarters.

(3) The Sub-Divisional Officer, imposed fine of Rs. 15 to workman for not attending to work properly.

(4) At the time you made payment 2 workmen remained absent. 20

2. (*a*) What are the Various Systems in P. W. D. for executing work ?

(*b*) Point out special features of :—

(*i*) B_1 and B_2 Contract forms.

(*ii*) D Contract forms.

(*iii*) Schedules A and B of a Contract agreement. ... 16

3. How and when are duplicate and Triplicate receipt books used ?

Describe complete procedure by quoting an example of use of at triplicate receipt book and disposal of its counter foils 16

4. (*a*) What is an administrative approval and Technical sanction ?

(*b*) A small Police Chowky 10′×10′ clear inside has a contry tiled roof. It is to be replaced by a Manglore Tiled roof. Allocate the estimated amount & state how will you obtain funds 16

5. How are measurements generally recorded ?

What allowance for shrinkage and voids will you make in the following cases ? :—

(1) Rubble.

(2) Metal.

(3) Hard Murrum.

(4) Embankment from borrow pits

Or

by Sectional areas.

(5) Cement concrete, in foundations 16

6. Differentiate between :—

(*i*) Lapse and Surrender.

(*ii*) Liabilities and anticipated expenditure.

Marks.

(*iii*) Revised and Reduced estimates.
(*iv*) Stock and Store.
(*v*) Task work and Piece work.
(*vi*) Requisition and Rate List.
(*vii*) Work charged Establishment & Temporary Establishment. 16

Classify the heads of each of the following Works :—

(*a*) Providing 15 ft. wide cement concrete surface over 12 ft. wide Existing W.B.M. surface six miles in length of a Provincial Highway.
(*b*) Dismentling and reconstructing one of the wings and one parapet of a drain.
(*c*) Providing tandur stone floor over the existing mud floor of a store shed in your section.
(*d*) Relaying 3/4″ premix carpet over the existing black topped surface of one mile of road in your section.
(*e*) Constructing a slab drain in place of a dip. ... 16

8. You are a holder of regular impreset of Rs. 500—

(*a*) You are asked to make payment of passed bills given below. Write down the imprest & state what would you do of your (*i*) imprest account and (*ii*) remaining Balance.

Data :—

(1) Recoupment of Rs. 475 by Hand receipt No. 5005 on 9–7–1950.
(2) M. R. amounting to Rs. 205 of C.R. to Bombay Ahmedabad road given on 10–7–50.
(3) Acquittance Roll of Work-charged Establishment amounting to Rs. 175 of Constructing Dispensary at Pardi, given on 7–7–1950.
(4) Railway receipt for cement on Stock amounting to Rs. 95 given on 8–7–1950.

(*b*) How would you account for a bill of Rs. 50 by Check given for payment to party concerned & paid by you on 9–7–1950. 16

Building Construction and Preparation of Materials.

(*Written—Marks—100.*)

7th August 1950.

(TIME—3 P.M. TO 6 P.M.]

Answer any eight.

1. Explain with sketches where necessary, any eight of the following :—

(1) Damp-proof course.
(2) Sash Bar.
(3) Intrados.
(4) Drip Moulding.

(5) Hip rafter.
(6) Eave Board.
(7) Corbelling.
(8) Relieving Arch.
(9) Neeru.
(10) Skirting.
(11) Vehicle.
(12) Down Pipes.

2. (*a*) State Briefly Characteristics of good timber.
(*b*) What is wet rot and dry rot ? Under what conditions do they develop ? What precautions will you take to preserve timber ?

3. What do you understand by :—
(*i*) Fat line, (*ii*) Hydraulic Lime. How are they used in building construction.
Explain with sketch how lime is commonly manufactured.

4. What are characteristics of black cotton soil. Explain with how you will found a two storied building sketches on such soil. What is the latest suggestion ?

5. What do paints consist of ?
What are their uses ?
Where will you adopt coiling, varnishing, and painting ?

6. Give specifications for :—
(1) Brick Nogging.
(2) Manglore tiled roof.
(3) Cement plaster.
(4) White washing 2 coats.

7. Give rate analysis for—
(*a*) 2nd class Brick masonry in cement mortar 1 : 6. Brick to be conveyed 8 miles from Kiln.
(*b*) Coursed rubble masonry 2nd sort in cement mortar 1 : 6.
Rubble is available at quarry 12 miles, away from work.
Sand is available near work cement to be supplied at Rs. 100 per Ton on site.

8. What are the different types of roof trusses and up to what spans they are used ?
Give a neat sketch of a truss for a span of 45′ and state the materials you will use.

9. How will you measure :—
(1) Painting trellis work.
(2) Painting door partly glazed and partly panelled.
(3) White wash outside and colour wash inside.
(4) Painting venitioned door.
(5) New doors and windows.
(6) Cement plaster inside.

10. Explain with neat sketches the different types of stair cases in use, What is general tistipulation with regards to rise and tread.
Name different members in a stair case.

11. You have been asked to construct cheap houses with a life of about 10 years. Describe the different types you know. Give plinth area rates for each type.

12. Explain R.C.C. and show the position of reinforcement in the following cases :—
(1) Chhaga extending 2-6 from a wall
(2) Beam continuous over many spans.
(3) Slab over an opening of 10′ road culvert.

Roads and Buildings.

(*Written—Marks—100.*)

8th August 1950.

(TIME—11 A.M. TO 2 P.M.)

Section I.

Roads.

(Attempt any five from Section I

(*Marks—50.*)

1. What do you understand by :—
(1) National Highway.
(2) Provincial Highway.
(3) Major District Road.
(4) Other District Road.
(5) Village Road.
State (*i*) formation width, (*ii*) width and thickness of wearing surface, (*iii*) stipulations for cross drainage works in each case.

2. What do you understand by modern surfaces ? What construction will you suggest for the following :—
Give reasons to justify your suggestions.
(1) Light cart traffic and medium motor traffic,
(2) Heavy motor traffic.
(3) Heavy cart traffic.

3. You are in charge of 20 miles length of M.D.R. Road. Rs. 20,000 have been allotted for Maintenance and Repairs. Prepare a sample C.R. estimate.

4. You are asked to survey and prepare plans and estimate for a village approach road 2 miles in length. Describe in details how will you proceed and what plans will you submit along with the project.

5. Why are trees planted on the road side ? Give sketches showing how you will plant and protect them on your road side. Which is the best season for (*i*) cutting an overhanging branch, (*ii*) lopping of small branches ?

6. When will you adopt rolling by (*i*) Bullock roller, (*ii*) Power Roller What reasonable progress you expect from each type for rolling 12′ width W.B.M. surface 2″ thick. Work out details and analysis of rates for rolling over a mile of W.B.M. surface 2″ thick, 12″ width by a power roller.

7. Explain the following :—

(*i*) Camber.	(*vi*) Super-elevation.
(*ii*) Voussoir.	(*vii*) Water-Tables.
(*iii*) Road Dam.	(*viii*) Catch-Water Drain.
(*iv*) Corrugation.	(*ix*) Ruling gradient.
(*v*) Abutment pier.	(*x*) Weep holes.

Section II.

Buildings.

(*Marks—50.*)

Attempt any four questions.

1. Draw a neat sketch of an Acqa Privy. Explain its advantages. State other types you know What type will you suggest for a—
   (1) District Bungalow rarely occupied.
   (2) Residential Bungalow for Class I Officer.
   (3) Circuit House.

2. Explain with sketches, where necessary :—

(1) Queen closure.	(6) Shuttering.
(2) Haunches.	(7) Style.
(3) Quoins.	(8) Tie Beam.
(4) Bridging Joist.	(9) Valley-gutters.
(5) Shoring.	(10) Headers.

3. Give detailed rate analysis for R.C.C. work 100 C.ft. 1 : 2 : 4 proportion. Assume prevailing rates in your Division.

4. What quantities of following materials are required :—
   (1) Bricks, in 2nd class Brick masonry 100 C. Ft.
   (2) Rubble in uncoursed rubble masonry 100 C.Ft.
   (3) Planks in 100 Sq. Ft. Plank ceiling.
   (4) Mangalore tiles in 100 Sq. Ft. of roof.
   (5) Country tiles single in 100 Sq. Ft. of roof.
   (6) Wood work including frame in 4′×7′ panelled door.

5. Give sizes for the following :—
   (1) Motor Garrage for a truck.
   (2) Compound gate of P. W. D. Store.
   (3) Shed for Steam Road Roller.
   (4) Bath room in P. W. D. Rest House.
   (5) Office room for Class I Officer.
   (6) Office room of Sectional Officer.

6. Give detailed specifications for :—
   (1) Cement concrete 1 : 5 : 10 in foundation.
   (2) Murum floor.
   (3) Guniting.

Practical Drawing.

(*Marks—100.*)

8th August 1950.

(TIME—3 P.M. TO 6 P.M.]

1. Draw (*a*) Plan, (*b*) Elevation and (*c*) Section for Store Shed having 2 rooms 16′×12′ inside dimensions.
   2 Bath Rooms 8′×6′ inside dimensions in the rear Verandah 7 Ft. front Verandah.

   Data—Trial Pit results show upto 0 to 2 Ft. black cotton soil below ground level.
   2 to 4 Ft. below mixed soil.
   4 to 5 Ft. below Yellow earth.
   5 Ft. & below average murum.

   Thickness of plinth wall 18
   Height of plinth....18″ above ground level,

Floor of cement concrete.
Roof of cement asbestos sheets.
Assume other details not given.

OR

Draw (*i*) Plan, (*ii*) Elevation and (*iii*) Section for a 10 feet clear span R.C.C. drain with wing walls. Constructed on a M.D.R.

Data Trial pit results show that Hard and stable Strata is available below 4 feet of average ground level.

The H.F.L. 7 feet higher than Bed level.

The Thickness of slab with wearing coat=15".

Thickness of abutment at top=2'-6"

Practical and Oral Test in Surveying and Setting Out.

(*Marks—50 + 50 = 100.*)

9th August 1950.

(TIME—6 HOURS.)

Marks.

1. Line out the foundation plan of building as per accompanying plan 50
2. Find out the area of the given figure by planimeter .. 10
3. Explain the various parts and working of Prismatic compass. 5
4. Find out the angle *ABC* with the help of Theodolite .. 10
5. What are permanent adjustment of a Dumpy Level ? How do you correct it ? 10
6. Take levels of various points shown to you and complete the circuit and close the field book 15

Roads and Buildings.

10th August 1950.

(*Oral—25 Marks.*)

1. Explain :—
   (1) Catchment area.
   (2) Run-off.
   (3) Discharge.
   (4) Hydro Graph 5

2. What is a camber and cross fall ?
   What camber will you provide for following types of road :—
   (1) Earth.
   (2) Murum.

Marks.

(3) Water bound Macadam.
(4) Asphalt.
(5) Concrete. 5

3. Define :—
(1) Raft foundations.
(2) Pile foundations.
(3) Well foundations.
(4) Open foundations. 5

4. (*a*) What are general items of repairs to be carried out immediately after monsoon to a road in your charge ?
(*b*) A brick arched culvert 15′ span situated in Ghat area surrounded with thick jungle has collapsed during monsoon. Traffic is heavy. What steps will you take to resume traffic. 5

5. (*a*) What land width will you acquire for a new village road ?
(*b*) Describe :—
(1) Ribbon development.
(2) Built up area 5

Buildings.

(*25 Marks.*)

1. (*a*) Why is lime mixed with sand ? How good mortar is prepared ?
(*b*) Why and how long bricks be coaked in water before use, in masonry ? 5

2. What is the weight of per C. ft. of the following items :—
(1) Cement, (2) Teak wood, (3) Burnt brick masonry in cement mortar, (4) Reinforced cement concrete .. 5

3. (*a*) Differentiate between painting, distempering and white washing 5
(*b*) What will you provide on walls in :—
(1) P.W.D. Store on road side.
(2) 1st Class Rest House in City.
(3) Bungalow of Class 1 Officer 5

4. An outer wall of a grain godown has cracked at corners and also in plinth.
Give probable reasons for the same and what instructions will you issue to the Godown Keeper ? How will you strengthen the same ? 5

Marks.

5. What equivalent dead load will adopt for :—
   (1) Domestic building.
   (2) Office Building.
   (3) Library building.
   (4) Science Laboratory of a School.
   (5) Warehouse 5

Buildings Construction and Preparation of Materials.

(Oral—50 Marks.)

1. State what task work can be expected from an experienced artisan or a labourer :—

   (1) Brick work II-Class in cement mortar; (2) Pointing to stone masonry ; (3) Plank ceiling ; (4) Door panelled 4′ × 7′ with frame ; (5) Cleaning grass from Bungalow compound 5

2. What usual quantities of following materials can be conveniently carried in a Bullock cart :—
   (1) Bricks ; (2) Slaked lime ; (3) Country tiles ; (4) Manglore tiles ; (5) Cement bags 5

3. Explain the following :—
   (1) Underpining ; (2) Grouting ; (3) Tell-Tale .. 6

4. What is safe permissible load on :—
   (1) Black cotton soil ; (2) Moist clay ; (3) Compact sand ; (4) Murum ; (5) Brick work in cement mortar ; (6) Cement concrete 1 : 2 : 4 9

5. What are the prevailing rates for the following items in your Sub-Division :—
   (1) B. B. masonry in cement mortar 1 : 6 with cem plaster inside for a well 100 c.ft. ; (2) Cemen. concrete 1 : 5 : 10 in foundation 100 c.ft. ; (3) Plain planked door 1 s.ft. ; (4) Teak wood Trellis work 100 s. ft. ; (5) White wash 3 coats. 100 s. ft. 10

6. What is average weight of the following :—
   (1) Single country tile and battens per sq. ft ; (2) Asbestos sheet roof 5/32″ per sq. ft. ; (3) Asbestos sheet roof 1/4″ per sq. ft. ; (4) Manglore tile and battens per sq. ft. ; (5) Linseed oil per c. ft. (6) Glass crown per c. ft. ; (7) Asphalt drum full. (8) Asphalt drum empty ; (9) water per c.ft. ; (10) Manglore tile when dry 15

PROGRAMME OF THE PROFESSIONAL TEST EXAMINATION OF D. L. B. OVERSEERS, 1950.

24th October 1950—

Tuesday, 11 a.m. to 2 p.m.—Divl. A/cs. and L. F. A/cs.

3 p.m. to 6 p.m.—Building Construction and Preparation of Material.

25th October 1950—

Wednesday, 11 a.m. to 2 p.m.—Road Construction and Maintenance.

3 p.m. to 6 p.m.—Estimating.

26th October 1950—

Thursday, 11 a.m. to 2 p.m.—Practical Drawing;

3 p.m. to 6 p.m.—Optional subjects.

27th October 1950—

Friday, 10-30 a.m. to 1-30 p.m.—Practical Test in Setting Out.

2-30 p.m. to 5 p.m.—Practical Test in Surveying.

5-15 p.m. to 6-15 p.m.—Oral.

No. AE/ of 1950.
Public Works Department,
Ahmedabad, October 1950.

Copy forwarded with compliments to the President, District Local Board, Ahmedabad and Kaira at Nadiad for information and guidance. The candidates may be informed of the programme early.

(Signed) D. S. Borkar,
Executive Engineer,
Ahmedabad Division.

Copy to :—

(1) Shri Tripathi, Keshavlal Gordhandas, D.L.B., Overseer, Daskroi Taluka, D.L.B., Ahmedabad.

(2) Shri Fulabhai Shankerbhai Patel, D.L.B., Overseer, Nadiad.

(3) Shri Raojibhai B. Desai, S.D.O., D.L.B., Nadiad.

(4) Shri C. P. Patel, D.L.B., Overseer, Nadiad.

(5) Shri K. C. Vyas, D.L.B., Overseer, Nadiad.

PROFESSIONAL TEST EXAMINATION OF D. L. B. OVERSEERS, 1950.

NORTH GUJARAT CIRCLE.

AHMEDABAD.

Sub-Divisional and Local Fund Works Accounts.

(*Marks—100.*)
Tuesday, 24th October 1950.
(TIME—11 A.M. TO 2 P.M.)

Marks.

1. Explain any eight of the following terms :—
   (1) Specifications; (2) Unpaid registers; (3) Hand receipts; (4) Register of works; (5) Vouchers; (6) Running Account Bill; (7) Tenders; (8) Completion certificates; (9) Check measuring officer; (10) Administrative sanction 12

2. What do you understand by "Register of Projects"; where are they maintained? How is the Board guided by such registers?

   State in details the points of considerations to be made by the Board in financing any work 12

3. State the procedure how Plans and Estimates for original works are prepared and finally approved.

   An original work costing Rs. 6,000 is proposed for execution. Which of the following way you will adopt—(1) By piece work; (2) By rate lists; (3) Contracts? 8

4. What are "Morning Reports"? How and by whom are they prepared? Explain how they serve as an effective check on muster rolls 9

5. State the difference between "Security" and "Earnest Money", why are such deposits necessary? What would be the effect in not calling for such deposits? 9

6. What do you understand by "Muster Rolls"? Explain the procedure how they are issued, prepared, closed and finally paid.

   State how payment can be made for a muster roll when the work turned out is not susceptible of detailed measurements 11

7. What do you mean by "Stock"? How is the provision made by the Board for its purchase?

Marks.

State how it is purchased and finally utilised on work.

How and where are stock accounts maintained ? How are effective checks made ? How is stock verified and certified by the Engineer at the close of the year ? ... 11

8. State the duties to be discharged by a taluka Overseer and care to be taken to get efficient working when a work is executed :—
   (*a*) Departmentally by rate lists ;
   (*b*) By Contracts ;
   (*c*) Social Workers of a village ;
   (*d*) Village Panchayat on behalf of the Local Board ... 12

9. What are " Original Works " ? What is the difference between a " Major Work " and " Minor Work " ? How is major work register written and maintained in D.L.B. Office ? How and where are minor work registers maintained ?

OR

Write short notes on any five of the following :—
   (1) Re-appropriation ;
   (2) Deviation statements ;
   (3) Repair estimates ;
   (4) Measurement books ;
   (5) Civil Works ;
   (6) Incidental expenditures ;
   (7) Reallotments 10

10. State the correctness or otherwise of the following :—
   (1) An original work costing Rs. 2,600 given by the piece work with the special sanction of the board ;
   (2) The work of a new cattle trough was commenced for execution as soon as the lans and estimates were prepared and approved ;
   (3) A Schedule of rates for the whole district prepared by the Engineer and kept in account branch to facilitate Bill checking ;
   (4) Repair works given precedence over the original works ;
   (5) A non-local Board work taken up by the Local Board for execution, was carried out and the amount of the bill claimed after completion of the work ;
   (6) Surplus materials remained over after completion of a work was disposed off by the Overseer by holding a public auction on site and the amount realised credited in Petty Cash Book.
   (7) A work abandoned after partial execution was restarted with a fresh estimate being prepared ·
   (8) Sanction accorded to current repair estimates was believed to have been lapsed at the end of the year. 6

Building Construction and Preparation of Materials,

(Marks—100.)

Tuesday, 24th October 1950.

(TIME—3 P.M. TO 6 P.M.)

Marks.

1. Explain any item of the following terms ? Draw sketches where possible ;—

(1) Cornice,	(9) Gable,
(2) Hold fast,	(10) Wall plate,
(3) Lintel,	(11) Brick noggin,
(4) Sky light,	(12) Jack arch,
(5) Intrados,	(13) Headers,
(6) Key stone,	(14) Stretchers,
(7) Eaves board,	(15) Purlins,
(8) Principal,	

15

2. Answer any five of the following :—

(*a*) What are the advantages of hydraulic line in building construction ?

(*b*) How can it be differentiated from fat lime ?

(*c*) For what purpose is fat lime generally used ?

(*d*) If only fat lime is available in your locality how would you use it to make good strong lime mortar ?

(*e*) What are the proportions of materials used for lime mortar ? Name the materials.

(*f*) Describe the process of making good lime mortar, by a bullock ghani. ?

(*g*) What is the rough test to see that the mortar being used is good ? .. 15

3. (*a*) What are English and Flemish bonds in brick masonry ; (*b*) show the T type connection (English Bond) of a 9" wall with a 13½" wall. Give sketches .. 8

4. What are the safe permissible loads on foundations of a building in (1) alluvial soils, (2) black cotton soil, (3) made-up earth 6

5. Give a dimensioned sketch of a wooden roof truss for 15' span (clear) between walls 13½" thick and name each individual member stating the type of stresses to which it is subjected. Give sizes of scantlings required .. 11

6. Give the number of bricks required for 100 cft. of (1) Brick in lime 2nd sort and (2) Brick in lime 1st sort masonry ..

or

Give the number of tiles required for 100 sft. of (*a*) country tiled (single) roof, (*b*) Manglore tiled roof .. 4

Marks.

7. What are the parts of a building in which R. C. C. is used with advantage ? What stresses are usually permissible in concrete 1 : 2 : 4 and steel ? Give the quantities of concrete materials (excluding steel) required for 1 : 2 : 4 R. C. C. work 100 sft. of 4" thick floor slab and describe how the concrete is to be prepared 11

8. Give rate analysis for 100 sft. of plain planked doors with Bulsar Teak and chocolate oil paint 10

9. Under what circumstances are the following paints used with advantage :—
   (1) Oil paints, (2) Distempers, (3) White wash with lime three coats, (4) Yellow earth wash.
   Give prevailing rates for 100 sft. for each of these in your District 8

10. Give specifications for excavation, lime and brick bat concrete for foundation, and plinth masonry of brick in lime masonry second sort 12

Road Construction and Maintenance.

Wednesday, 25th October 1950.

(TIME—11 A.M. TO 2 P.M.)

(*Marks—100.*)

1. Explain any eight of the following items :—
   (1) Traffic intensity, (2) Index plan, (3) Formation, (4) Berms, (5) Bleeding, (6) Profiles, (7) Seal coat, (8) Ruts and hollows, (9) Bench Mark, (10) Subgrade 11

2. Write a detailed specification for earthwork in embankments for roads. 8

3. Draw a neat cross section for a metalled road in embankment the following date :—

   Gradient 1 in 600.
   Land width 66'.
   Datum (G.L.) 84·94.
   Formation Level 86·94.
   Foundation of roubles 6".
   Depth of wearing surface 5".
   Cross fall 1 in 32.
   Width of top surface 24'.
   Side width 3' 8

Marks.

4. State various types of river crossings you know. Explain which construction would you propose for a crossing, stream with the following data :—

Span of the stream5 60′, R.L. of stream bed 106·50, R.L. of top bank of the stream 120·00, water way 60′ in the centre of the stream; average depth of water 1′-3″ for a part of year. H.F.L. 122·50, average rainfall 24″.

Select your own design, dimensions and materials for the construction. Give sketches 12

5. What is the difference between guard stones and boundary stones ? When are they provided on road sides ? State the pattern and positions where they are provided on road side and causeways

or

Two roads meet at an angle of 170°. It is proposed to provide a curve of 15 chain radius. Find out the distance between the apex and the point of curve starting, length of the curve, the distance between the apex and the centre of curve :—

(given : tan 5°=.0875 and sin. 5°=.0872.) 9

6. Prepare a type estimates for C.R. to a metalled road 10 miles long. Select your own data and current rates in your district. State what percentage of C.R. grant you will make available for resurfacing 9

7. Explain fully with sketches :—
(1) Superelevation, (2) Creteways, (3) Kerbing, (4) Sign-posts, (5) Catchwater drain. (6) Level crossing, (7) Borrow pits, (8) Fan junctions, (9) Soling, (10) Cross fall 15

8. State the various types of road construction in your district. Which type would you prefer for your district condition ? Give reasons. What would be the rough cost of that construction per mile ? 11

9. What are the obligatory points of considerations for alignment of a new road when you come across :—
(*a*) a river, (*b*) an existing water bound macadam road, (*c*) a railway line, (*d*) paddy fields 10

10. State the care to be taken and observations to be made for attending an existing metalled road to keep it in good condition.

State briefly the different items to be looked after for road maintenance in various months of the year .. 8

Estimating.

(Marks—100.)

Wednesday, 25th October 1950.

(TIME—3 P.M. TO 6 P.M.)

Marks.

1. Find out the following quantities from the given plan of a building :—
   (*a*) Excavation,
   (*b*) Concrete,
   (*c*) Brick masonry in lime mortar in foundation and plinth,
   (*d*) Flooring or doors and windows,
   (*e*) Asbestos roofing 60

   Note.—Necessary sketches should be given where necessary for arriving at the measurements.

2. (*a*) State the quantities of bricks, lime and sand required for item I (*c*) of above.
   (*b*) What will be the rates for those (*a* to *e*) items in your section 15

3. Work out the quantity of earth work in cutting from the following L.S. and type section 25

Practical Drawing.

(Marks—100.)

Thursday, 26th October 1950.

(TIME—11 A.M. TO 2 P.M.)

1. Draw to your convenient scale the plan, section through the centre and elevation of a structure with the following data :—

   The structure is a 2 span skew slab drain.

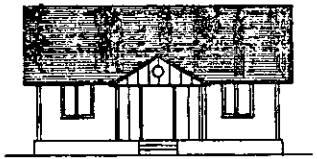
   The construction is to be made on a rain water drain crossing a major District Road. The area of water way to be provided 96 sq. ft. including free board.

   The water drain is 5′ in depth.

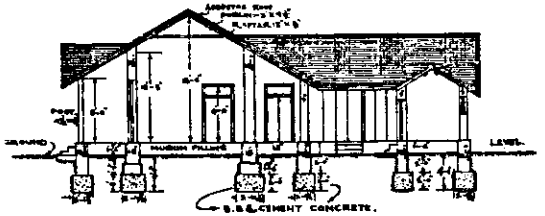
   Anagle of skew 30^{0}

   Observation of a trial pit :—Hard Murum at a depth of 4′-0″ from drain bottom.

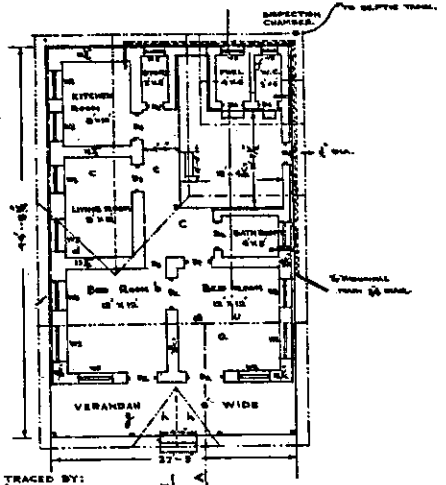
   Select your own design and choose your own required further data for the construction 100



FRONT ELEVATION.



SECTION ON ABCD.



Note:-

==== PROPOSED WATER PIPE LINE. SHOWN IN DOTTED RED.

═══ PROPOSED DRAINAGE LINE SHOWN IN BLACK.

Schedule of Doors.

S.No.	Particulars		Sizes.
1	DOOR.	D1.	3'-6"x7'-6"x1'-6"
2	"	D2	3'-6"x6'-6"x1'-6"
3	"	D3	2'-6"x6'-6"x1'-6"
4	WINDOW	W1	3'-6"x3'-6"x1'-6"
5	"	W2	2'-6"x3'-6"x1'-6"
6	"	W3	3'-0"x1'-6"

TYPE DESIGN.
FOR
QUARTERS FOR AN OFFICER

MAXIMUM PAY Rs.200.

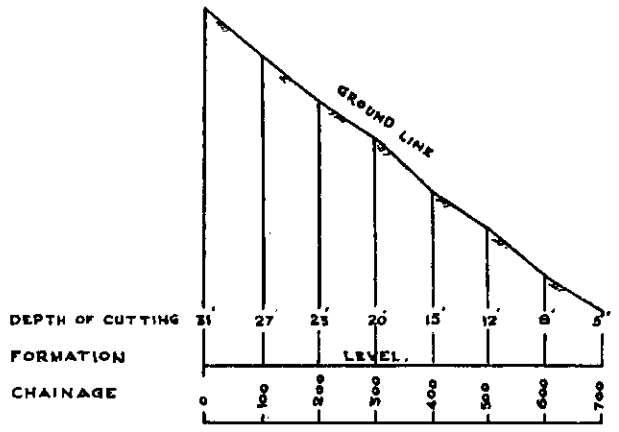
Scale 0 4 8 Feet

PLINTH AREA 1052.50 Sq.ft.

1950

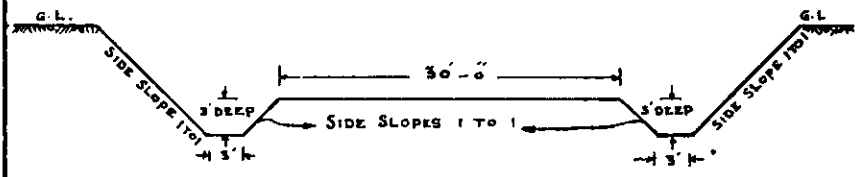
TRACED BY:
Rajkumar.
CHECKED BY:
S.S.GOGATE, (S.S.S.I.)
HEAD DRAFTSMAN, P.W.D.
SECRETARIAT, BOMBAY.

G.P.P.: P. POONA, 51.



LONGITUDINAL SECTION

SCALE:- { HOR. 200' TO 1"
VER. 10' " 1"



TRACED BY.
P.G.KEWALRAMANI.

TYPE CROSS SECTION

SCALE 0 10'

CHECKED BY.
S.G.GOGVEKAR. 30-4-1951
HEAD DRAFTSMAN. P.W.D.
SECRETARIAT. BOMBAY.

PROFESSIONAL EXAMINATION
FOR
OVERSEERS
1950

G.P.Z: P. POONA, 51.

Optional Subjects—(i) Building.

(Marks—50.)

Thursday, 26th October 1950.

(TIME—3 P.M. TO 6 P.M.)

Marks.

1. What are the safe permissible loads per square foot on :—
   (1) Alluvial compact soil.
   (2) 1 : 3 : 6 sand cement and brick-bat concrete.
   (3) A column of well burnt bricks in 1 : 6 cement mortar resting on (2) above.

   Draw out sketch showing the foundation footing for a column of bricks 2′×2′ subjected to a load of 18 tons including its own weight. Give dimensions 12

2. What is the live load usually allowed on the floors of the following buildings :—
   (*a*) School houses;
   (*b*) Ware houses;
   (*c*) Public assembly halls;
   (*d*) Ordinary domestic houses 8

3. What are the current rates in your district for the following items ? :—
   (*a*) 1 : 3 : 6 brick-bat in cement concrete.
   (*b*) Brick in cement 1 : 6 second sort masonry for plinth.
   (*c*) Brick in cement 1 : 6 second sort masonry for superstructure.
   (*d*) Mangalore tiled roof.
   (*e*) Cement plaster 1/2″ thick (1 : 4) ... ...

4. Give specifications for :—
   (*a*) Indian patent stone flooring.
   (*b*) Murum flooring with cowdung wash.
   (*c*) Brick on edge flooring 12

5. (*a*) A project for a village school with four class rooms each for 40 boys is to be prepared. Give a rough sketch showing the site and the North line and explain how you propose to orient and ventilate the building. Site available 200′×200′. Future expansion of the school building is possible.

   (*b*) What will be the difficulties for the excavation of such a building in a village and how would you overcome them ? 13

Optional Subjects—(ii) Sanitary Engineering.

(Marks—50.)

Thursday, 26th October 1950.

(TIME—3 P.M. TO 6 P.M.)

Marks.

1. Suggest and describe various processes for refuse disposal .. 10
2. Explain the terms :—
   (1) Gully trap. (2) Damp proof course. (3) Cess pool. (4) Potassium permanganate. (5) Tube well water. (6) Septic tank. (7) Push cock. (8) Ventilation .. 12
3. Explain from sanitation point of view the principle points of considerations for choice of site for dwelling houses

   or

   You have interest in making existing Indian Villages ideal. How would you achieve this with the least expenses especially for sanitation part ? 9
4. Discuss regarding the siting of wells of drinking water purposes from sanitary point of view and essentials of good wells for drinking water in rural areas.

   What precautionary measures would you suggest to guard the well water against pollution ? 9
5. State an discuss general sanitary requirements for design of a school building construction

   or

   What do you mean by "Malaria ?" What are the general measures to be adopted for—
   (1) Personal prevention,
   (2) Public prevention 10

Total Marks 50

Optional Subjects—(ii) Arboriculture.

(Marks—50.)

[Thursday, 26th October 1950.]

(TIME—3 P.M. TO 6 P.M.)

Marks.

1. Write in short the art of selection of avenue trees and their spacing for a road side arboriculture .. 9
2. Write short notes on any four of the following :—
   (1) Steading young trees. (2) Raising trees from cutting. (3) Level of planting. (4) Testing seeds. (5) Sewing of seeds. (6) Lopping .. 12

Marks.

3. What class of tree plants are generally selected for road side arboriculture in your district ? Give reasons.

   Describe the procedure of watering young plants .. 10

4. What are the general conditions for the selection of a nursery site ?

   Which plants are generally nourished in a nursery ? ... 10

5. Describe with sketches the various types of protecting guards for young plants on road side. Which of the guards would you select for protecting plants in your district ?

   or

   What do you know of sickness of plants ? How can you suspect insect disease in a plant ?

   What is the remedy for the disease ? What are the necessary treatments for established trees ? 9

Total Marks 50

Practical Tests in Setting Out.

(*Marks—100.*)

Friday, 27th October 1950.

(TIME—10-30 A.M. TO 1-30 P.M.)

Marks.

1. Line out on the ground the foundation plan of the dispensary building from the enclosed drawing.. .. 75

2. Set out a road curve on the ground by chord and offset method.

   Given :—angle of intersection of the road 170°.

   Proposed Radius of the road curve 1,500 ft.

   Given :—tan 51 = ·0875.

   Find out the distance between the apex and centre of the chord by measurements on the ground 25

Practical Test in Surveying.

(*Marks—100.*)

Friday, 27th October 1950.

[TIME—2-30 P.M. TO 5 P.M.]

Note.—Twenty marks are reserved for the knowledge about surveying instruments.

Marks.

1. With the aid of a level and staff, find out the reduced levels of the points, A, B, C, D, E and F. Point A to be taken as BM with a datum of 80 R.L. Prepare a field work for the above and find out the difference in levels between A & E (last level reading should be shown). 35

Marks.

2. With the aid of a chain and tape plot the points, A, B, C and D as shown on the ground. What is the distance between A and C ? 20

3. Given the length of one side of a polygon as 40 feet of the polygon A, B, C, D, E and F, with aid of a compass, find out the included angles 25

Building Construction and Preparation of Materials.

Oral—(Five Marks for each Question).

Friday, 27th October 1950.

(TIME—5-15 P.M. TO 6-15 P.M.)

1. What do you understand by the initial and final set of cement ?
2. What are the standard sizes of bricks and what is the maximum admissible percentage of water soaking ?
3. What do you understand by a damp proof course ? Why and where it is provided ?
4. What do you understand about landings ; why and where they are provided ?
5. What is saw tooth construction ; where and why they are provided.

Road Construction and Maintenance.

1. What is meant by ruling gradient, in plain, undulating and hilly tracts ?
2. What is the function of camber in road construction ?
3. While resurfacing the metal surface of a water bound macadam road, how will you carry out the following operations ? :—

   (*a*) Barrelling, (*b*) rolling.

   How much coal is required per mile of rolling 10′ wide ?
4. What is rule of thumb for providing small cross drainage works on a road ?
5. (*a*) What care will you take in maintaining a road passing through side long ground ? (*b*) What do you understand by modernised road surface and stabilised road surface ? (*c*) What deduction for void do you allow for metal, sand and brick-bats ?

Buildings (Optional).

1. What is relieving arch ?
2. What do you understand by pitch of the roof; what is its standard for mangalore tiled roof and corrugated iron sheet roof ?
3. What is a clear storey window, drip mould, string course ?
4. What type of trusses would you provide for a span of 10′, 20′, 30′ and 50′?
5. What is water seal, dado and vent pipe in case of W. C. ?

Arboriculture.

1. What is the best season for planting new trees :—(1) from seedling, (2) from cutting ?
2. What types of plants do you select for growing in the nursery ?
3. What care is necessary for upbringing of new plants ?
4. What shape and size of pits you would prepare for the following trees :—

   (*a*) Gulmohor, (*b*) Ashok, (*c*) Room and (*d*) Babul ?
5. Why is arboriculture provided on roads ?

Sanitary Engineering.

1. What is a sewer and what gradient is generally provided ; why are man-holes necessary ?
2. What floor area is to be provided per boy in a hostel ?
3. What are the functions of a septic tank ; why and at what height, flushing tanks are provided ?
4. What is aqua privy, and how is the disposal achieved in such an arrangement ?
5. Define—(*a*) U. R. R., (*b*) gully trap, (*c*) float valve, (*d*) Y junction and (*e*) chlorination.

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